

What is claimed is:

1. An apparatus for storing cassettes, comprising:
a plurality of cassette storage shelves; and
a cassette mover to carry a cassette between the shelves and a docking station, the
cassette mover including a support member positioned in front of the shelves and movable
in a path adjacent to the shelves, and an end effector configured to engage the cassette, the
end effector movably connected to the support member.

2. The apparatus of claim 1, wherein the shelves are configured to be positioned
adjacent a cleanroom wall.

3. The apparatus of claim 2, wherein one or more of the shelves are positioned above
the docking station.

4. The apparatus of claim 1, further comprising a frame supporting the cassette
storage shelves and the support member.

5. The apparatus of claim 4, wherein the frame substantially fits below the docking
station.

6. The apparatus of claim 1, wherein a lower end of the support member is slidably
connected to a frame.

7. The apparatus of claim 6, wherein the end effector is joined to a first slider which
slidably engages a first, vertical guide joined to the support member.

8. The apparatus of claim 7, wherein the support member is joined to a second slider
which slidably engages a second, horizontal guide joined to the frame.

9. The apparatus of claim 8, further comprising a first lead screw engaging the first
slider and a first drive motor to rotate the first lead screw and drive the first slider along

3 the first guide to move the end effector vertically.

1 10. The apparatus of claim 9, further comprising a second lead screw engaging the
2 second slider and a second drive motor to rotate the second lead screw and drive the
3 second slider along the second guide to move the support member and the end effector
4 horizontally.

1 11. The apparatus of claim 1, wherein the shelves are arranged in a vertical column
2 above the docking station.

1 12. The apparatus of claim 1, wherein the end effector includes a hook-shaped finger
2 adapted to engage a bottom surface of a flange on a top of the cassette.

1 13. The apparatus of claim 1, wherein each shelf includes a plurality of pins that
2 project vertically from the shelf to engage corresponding indentations in the underside of
3 the cassette.

1 14. An apparatus for storing cassettes, comprising:
2 a plurality of cassette storage shelves positioned adjacent a wall above a plurality
3 of cassette docking stations; and
4 a cassette mover to carry a cassette between the shelves and the docking stations,
5 the cassette mover including a support member positioned in front of the shelves and
6 movable in a plane parallel to the wall, and an end effector configured to engage the
7 cassette, the end effector slidably connected to the support member.

1 15. The apparatus of claim 14, wherein the shelves are arranged in a vertical column
2 above each docking station.

1 16. The apparatus of claim 14, wherein adjacent vertical columns of shelves are
2 separated by a vertical channel, and the cassette mover is configured to transport a cassette
3 to a selected support shelf by moving the cassettes vertically through the channel to
4 position the cassette substantially adjacent and above the selected support shelf, and then

5 horizontally to position the cassette over the selected support shelf.

- 1 17. A semiconductor processing station, comprising:
2 a processing system to perform a fabrication step on a substrate;
3 an interface wall separating the processing system from a cleanroom;
4 a docking station located in the cleanroom to support a cassette;
5 an opening in the interface wall;
6 a wafer transfer robot to transfer the substrate through the opening between the
7 docking station and the processing system;
8 a loading platform located in the cleanroom adjacent the docking station; and
9 a cassette stocker located in the cleanroom, the cassette stocker including,
10 i) a plurality of shelves aligned in a vertical column above the docking
11 station, and
12 ii) a cassette mover to carry a cassette between the shelves, the loading
13 platform, and the docking station, the cassette mover including a support member
14 positioned in front of the shelves and movable in a path adjacent to the shelves, and an end
15 effector slidably connected to the support member and configured to engage the cassette.
- 1 18. A method of operating a processing station, comprising:
2 storing a plurality of cassettes on a plurality of cassette storage shelves adjacent a
3 cleanroom wall above a docking station;
4 carrying one of the cassettes to the docking station with a cassette mover;
5 removing a substrate from the cassette; and
6 returning the cassette to the cassette storage shelves with the cassette mover.